



Conference Abstract

# Antibacterial activity of thin films TiO<sub>2</sub> doped with Ag and Cu on Gracilicutes and Firmicutes bacteria

Dragomira S. Stoyanova<sup>‡</sup>, Iliana A. Ivanova<sup>‡</sup>, Orlin I. Angelov<sup>§</sup>, Todorka G. Vladkova<sup>l</sup>

<sup>‡</sup> Sofia University "St. Kl. Ohridski", Sofia, Bulgaria

<sup>§</sup> Bulgarian Academy of Sciences, Sofia, Bulgaria

<sup>l</sup> University of Chemical Technology and Metallurgy, Sofia, Bulgaria

Corresponding author: Dragomira S. Stoyanova ([dragomira.stoyanova@abv.bg](mailto:dragomira.stoyanova@abv.bg))

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## Abstract

This research aims to study the antibacterial activity of thin films nanostructured TiO<sub>2</sub> doped with Ag and Cu on Gracilicutes and Firmicutes bacteria with clinical significance. The thin films were deposited on glass substrates without heating during the deposition by radio frequency magnetron co-sputtering of TiO<sub>2</sub> target and pieces of Ag and Cu. The total surface area of Ag was 60 mm<sup>2</sup> and this one of Cu was 100 mm<sup>2</sup>. The r.f. power was 50W and sputtering atmosphere was Ar (0,8 Pa). The thickness of the films was about 60 nm. The experiment was conducted under day light regime. The test strains *Bacillus cereus*, *Staphylococcus epidermidis*, *Salmonella enterica*, *Escherichia coli* and *Pseudomonas sp.* were used. The bactericidal effect was established at different time point between 30 min - 90 min for *Pseudomonas sp.* and *S. enterica*. The Firmicutes bacteria *B. cereus* and *S. epidermidis* were killed at 4<sup>th</sup> and 8<sup>th</sup> h of the treatment respectively. The effect against *E.coli* was bacteriostatic till 10<sup>th</sup> hour. The toxic effect was evaluated by classical Koch's method and optical density measurments. The results were confirmed by assessment of dehydrogenase activity inhibition. The film could be used in medical and clinical practice.

## Keywords

nanomedicine, bactericidal effect, Gram positive and Gram negative bacteria, clinical significant strains

## Presenting author

Dragomira S. Stoyanova

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## Hosting institution

<sup>1</sup>Department of "General and Industrial Microbiology", Faculty of Biology, Sofia University "St. Kl. Ohridski", Sofia, Bulgaria

<sup>2</sup> Central Laboratory of Solar Energy and New Energy Sources, Bulgarian Academy of Sciences, Sofia, Bulgaria

<sup>3</sup> University of Chemical Technology and Metallurgy, Sofia, Bulgaria

## **Author contributions**

Equal author contributions

## **Conflicts of interest**

The authors declare that there is no conflict of interests.